Louisiana Department of Environmental Quality (LDEQ)
Office of Environmental Services

STATEMENT OF BASIS

Shintech Louisiana LLC
Shintech Louisiana LLC - Addis Plant A
Addis, West Batone Rouge Parish, Louisiana
Agency Interest Number: 83425
Activity Number: PER20090001
Proposed Permit Number: 2639-V4

I. APPLICANT

Facility:
Shintech Louisiana LLC
9750 Hwy 1 S
Addis, West Baton Rouge Parish, Louisiana
Latitude: 30° 19' 11"
Longitude: 91° 15' 35"

Company:
Shintech Louisiana LLC - Addis Plant A
PO Box 358
Addis, Louisiana 70710-0358

II. FACILITY AND CURRENT PERMIT STATUS

Shintech Louisiana LLC, Shintech Louisiana LLC - Addis Plant A is an existing Polyvinyl Chloride (PVC) facility which currently operates under Permit No. 2639-V3, issued August 27, 2008.

The PVC manufacturing process includes the following major components:

- Raw material receipt, storage, and preparation;
- A batch suspension polymerization process;
- PVC product finishing;
- Final product handling and storage; and
- Support facilities.

Raw Material Receipt, Storage, and Preparation

The primary raw material, or feedstock, used to manufacture PVC is vinyl chloride monomer (VCM). Approximately 1.3 billion pounds of VCM per year is used in the process. VCM is mainly received at the plant via pipeline from an adjacent industrial facility. Other raw materials essential to the process are suspending agents, reaction initiators, inhibitors, and organic solvents. These materials are received by truck and stored in warehouses, storage tanks and under covered areas. The VCM, which is ready

for process polymerization upon receipt, is introduced to the PVC reactors via piping from a charge tank.

All necessary chemicals for the polymerization process are mixed and stored under proper conditions before charging to the reactors. Methanol, ethanol, and mineral spirits are used as solvents or anti-freeze agents for the polymerization process chemicals.

Batch Suspension Polymerization Process

The PVC suspension polymerization process produces PVC in the form of slurry by polymerizing VCM in water with reaction initiators and suspending agents. Reactors consisting of jacketed vessels with agitators and other related equipment. VCM is charged to a stirred autoclave reactor with the water and suspending agents (allowing VCM and water to form a single phase). After the ingredients are mixed, initiators are added to start the reaction and the VCM is converted to produce PVC. During polymerization, the reaction is controlled by the computer control system to maintain optimum conditions. The operation is a closed reactor operation with clean wall technology. A closed reactor does not require that the reactor be opened for every batch, minimizing VCM losses to the atmosphere due to the reactor openings. The PVC mixture, a slurry of 30-35% by volume PVC, is pumped to slurry holding tanks. Aqueous ammonia can be added to adjust the pH of the PVC slurry.

The bulk of the un-reacted VCM is removed by degassing to the gasholder and routed to the VCM recovery process. Recovered gas is compressed, liquefied and purified for re-use. The non-condensable gases (non-recovered VCM) in the recovery units are sent to the thermal oxidizers. VCM contaminated wastewater is sent to the wastewater stripper.

PVC Product Finishing

The purpose of this process step is to remove VCM from the PVC slurry. The product PVC slurry is discharged from the slurry tanks and fed to steam stripping columns where steam is used as the stripping medium. VCM recovered from the steam stripper is sent to VCM recovery units for reuse in the process. VCM contaminated wastewater is steam stripped to remove VCM and is then routed to the bio-treatment plant.

The PVC slurry is subsequently separated into PVC granules and water. There are two dewatering and drying units consisting of centrifuges and fluidized-bed dryers. After steam stripping, the PVC slurry is dewatered by centrifuges where it is separated into PVC wet cake and water. The PVC wet cake is then dried in a fluidized-bed dryer, which generates PVC granules. The PVC dry granules and air are separated by cyclone separators. In order to minimize particulate emissions, the air vent from the top of the cyclones is ejected to the atmosphere through a wet scrubber which has a minimum of fifty gallon per minute water flow rate. The dried PVC granules (final product) are screened by sieves before being sent to storage silos to remove over-sized products. Several grades of product are manufactured.

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Wastewater removed from the PVC slurry is sent to the on-site wastewater treatment plant (WWTP). The majority of methanol and ethanol charged to the reactors is part of the PVC slurry wastewater.

Final Product Handling and Storage

The PVC granules are transferred from the dryer systems to six product-storage silos and three bagging silos through pneumatic conveyor systems, which feature high-efficiency cyclone separators and baghouses to minimize particulate emissions. The final product is transported to customers by bulk trucks, railcars, flex bags, and paper bags. Broken bags are collected into hopper cars through the Broken Bag Recovery System, which has a baghouse to minimize particulate emissions. PVC granules remaining in empty railcars are collected into a hopper car cleaning silo through a vacuum cleaning system, which has a cyclone separator and baghouse to minimize particulate emissions.

Supporting Facilities

Supporting Facilities include bulk truck loading and unloading areas, railcar loading and unloading areas, on-site utilities, steam generating units, air emission control equipment and a wastewater treatment plant (WWTP).

Cooling water is recycled through the cooling tower system. Chlorine is used to control algae in the cooling tower.

Clean-burning fuels (natural gas) will be used for steam generating units (boilers), which are equipped with low nitrogen oxide (NOx) burners (LNB) and flue gas recirculation (FGR). The plant operates two thermal oxidizers to destroy non-recovered VCM. Non-recovered VCM contains a small amount of 1,2-dichloroethane, methyl chloride and other chlorinated and non-chlorinated hydrocarbons which come with the VCM feedstock as impurities.

Wastewater generated from the PVC process consists of wastewater from the centrifuges, reactor washing water, and direct contact process water. VCM-contaminated wastewater is collected in a storage tank via a hard pipe and sent to a pre-treatment unit where VCM is steam stripped. Stripped VCM is piped to a wet gasholder where most of the VCM is recovered for reuse in the process and the rest is sent to the thermal oxidizers. Effluent from the wastewater stripper is piped to the WWTP as well as the effluent water from the centrifuges.

The WWTP is a 2,000,000 gallons per day system consisting of a biological treatment system, pH adjustment basin, final basin and sludge dewatering system.

The biological treatment system includes a bio-treatment basin, clarifier, and other supporting equipment. Activated sludge is used to destroy methanol, ethanol, and other organic chemicals to reduce biological oxygen demand (BOD). Effluent from the biological treatment system is discharged to the final basin. A portion of the wastewater

treated in the biological treatment process is recycled and reused in the PVC plant process.

The pH adjustment basin receives cooling tower blowdown, boiler blowdown, thermal oxidizer blowdown and regeneration wastewater from the deionized water unit and softner. These wastewaters are pH adjusted and then discharged to the final basin.

The final basin receives effluent from the biological treatment system and from the pH adjustment basin. Effluent from the basin is discharged off-site to the Shintech's Mississippi River water station.

III. PROPOSED PROJECT/PERMIT INFORMATION

Application

A permit application was submitted on March 24, 2009 requesting a Part 70 operating permit renewal and minor modification for the Shintech Louisiana, LLC – Addis Plant A. Additional Information was submitted September 16, 2009.

Project

Shintech wishes to renew the Addis Plant A Part 70 Title V Operating permit. Additionally Shintech seeks to reconcile fugitive equipment leaks from railcar unloading to the facility-wide fugitive emissions (EPN P-16). There are no physical changes or changes in method of operation associated with this renewal permit.

Proposed Permit

Permit 2639-V4 will be the renewal and minor modification of Part 70 operating permit 2639-V3 for the Shintech Louisiana, LLC – Addis Plant A.

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Permitted Air Emissions

Estimated emissions in tons per year are as follows:

Pollutant	Before	After	Change
PM_{10}	75.17	75.17	-
SO_2	0.96	0.96	-
NO_X	62.62	62.62	-
CO	50.36	50.36	-
VOC	49.68	49.74	+0.06

IV REGULATORY ANALYSIS

The applicability of the appropriate regulations is straightforward and provided in the Specific Requirements section of the proposed permit. Similarly, the Monitoring, Reporting and Recordkeeping necessary to demonstrate compliance with the applicable terms, conditions and standards are also provided in the Specific Requirements section of the proposed permit.